

Remarks

The present response is filed with a Request for Continued Examination (RCE), and is responsive to the Office Action mailed in the above-referenced case on September 30, 2003. Claims 1-34 are pending for examination. The Examiner has maintained the rejection of claims 1-34 under 35 U.S.C. 103(a) as being unpatentable over Hsu (U.S. 6,363,319), hereinafter Hsu, in view of Viswanthan et al. ("Evolution of Multiprotocol Label Switching"), hereinafter Viswanthan.

Applicant as again carefully studied the prior art cited and applied by the Examiner, and the Examiner's rejection and statements of the instant Office Action. In response, applicant herein amends the base claims to more particularly point out and distinctly claim the subject matter of applicant's invention regarded as patentable. Applicant amends the language of the claim 1 to include specific limitations of several of the depending claims, limitations pertaining to calculating an updated tag by applying a normalizing function to the tag, wherein the normalizing function enhances network performance by reducing the number of bits involved in accessing the routing table bias table. The associated depending claims are accordingly herein canceled. Applicant presents claim 1 in its amended form below for convenience:

Claim 1 as amended now recites:

1. (Currently Amended) A method for routing packets in a multipath network of nodes, each packet having a routing in the network determined by a directed-graph index, comprising;

accessing a tag and directed-graph index of a packet at a first node, the tag including a plurality of bits included in the packet;

*determining a second node by using the tag to access a routing bias table;
calculating an updated tag from the accessed tag by applying a
normalizing function to the tag, the normalizing function used substantially
throughout the network;*

*determining an element of a successor set by using the normalized tag to
access the routing bias table;*

*replacing the tag of the packet with the updated tag to give an updated
packet; and*

routing the updated packet from the first node to the second node;

*wherein the directed-graph index determines at least one destination node,
and the routing bias table is selected from a plurality of routing bias tables
indexed by the first node and the directed-graph index, and the routing bias tables
satisfy an acyclic property, and the normalizing function enhances network
performance by reducing the number of bits involved in accessing the routing
table bias table.*

Applicant's independent claim 18 recites a method for routing flows in a multipath network of nodes in accordance with independent claim 1. Applicant accordingly herein amends the language of claim 18 similarly to that of claim 1, canceling the associated depending claims.

Applicant has argued extensively in previous prosecution response that the specific aspects of applicant's invention pertaining to replacing the tag of the packet with an updated tag, a tag normalizing function, and randomized packet routing, distinguish applicant's invention over the prior art cited and applied by the Examiner. Hsu, as admitted by the Examiner, is generally silent to replacing and updating an MPLS tag, adding that the reference focuses on the routing aspect, leaving the particulars of how labels are swapped to techniques well-

known in the art. The Examiner relies on Viswanthan to make up this deficiency, noting a reasonable but brought interpretation of a normalized tag and function.

Applicant argues, however, that although Viswanthan does teach replacing and updating an MPLS tag, Viswanthan teaches processing MPLS packets as MPLS packets. The packets arriving for processing by the system of Viswanthan arrive as MPLS packets, and are replaced by MPLS packets. Applicant's invention, in contrast, performs a normalization function on the tag, which does not arrive for processing as an MPLS packet, and calculates a new updated normalized MPLS packet to replace the original packet. The normalization function performed on the tag reduces the bits involved in routing table operations. Applicant, therefore argues that the Examiner's interpretation of a normalized tag and function, as taught in the prior art presented is improperly applied for reading on applicant's invention.

Applicant's invention teaches accessing the tag and applying the normalization function which enhances network performance by reducing the number of bits involved in accessing the routing table bias table. The fact that Hsu and Viswanthan both teach using MPLS tags, which are inherently normalized tags as known in the art, neither reference explicitly discloses normalizing the tag when access from the packet; rather, the references teach replacing one MPLS tag with another MPLS tag. Applicant's invention teaches, on the other hand, determining by algorithmic calculation, an updated and normalized tag replacing the original accessed tag with the new tag.

Upon very careful and thorough review of the references of Hsu and Viswanthan, applicant is confident that neither reference teaches, suggests or intimates the specific limitations as amended into applicant's independent claims, pertaining to the normalization of the tag, and determining an element of a successor set by using the normalized tag to access the routing bias table.

Further, regarding applicant's previous argument that the combined prior art fails to disclose or suggest, the Examiner notes a reasonable but broad interpretation of "randomizing packet routings" as recited in at least claims 10, 13, 26 and 29, adding that applicant discloses, but does not necessarily claim, that randomizing packet routings increases the likelihood that all routing resources are used in the network. The Examiner notes that, using the broad interpretation of "randomizing", Hsu teaches this aspect of applicant's invention.

Applicant argues, however, that Hsu does not explicitly teach randomizing packet routings as taught and claimed in applicant's invention. Hsu (col. 12, lines 31-40; col. 13, lines 4-22) discusses sensitivity toward congested links and biasing based on physical bandwidth of links. Applicant's invention, in contrast, teaches simply randomizing the routing of packets. The system of applicant's invention has no knowledge of congested links or physical bandwidth of links, and the teaching does not focus on these aspects. Applicant therefore argues that the Examiner's broad interpretation of "randomizing packet routings", and position that the teachings of the combined references as reading on applicant's teaching of randomizing packet routings is improperly applied in this case.


Further, regarding the reference of Hsu, the Examiner has noted that although explicit routing is disclosed in the reference, hop-by-hop routing is further supported. Applicant argues however that, again, the specific teaching of Hsu is improperly applied by the Examiner for reading on applicant's invention and claims. Hop-by-hop destination-based routing involves a packet having a destination address and each router in the network accesses the address of the packet and makes a routing decision on how to forward to packet. Applicant's invention takes this aspect steps further by actually replacing a tag with a normalized updated new tag calculated by applying a normalization function to the tag. This is clearly nowhere disclosed or suggested in Hsu.

In view of applicant's above arguments and substantial limitations to the base claims, applicant strongly believes that claims 1 and 18 are now clearly and unarguably patentable over the combined art presented by the Examiner. Claims 5-8, 19-20, 22 and 24 have been herein canceled. Depending claims 2-4, 9-17, 21, 23 and 25-34 are then patentable on their own merits, or at least as depended from a patentable claim.

If there are any extensions of time required beyond an extension specifically petitioned and paid with this response, such extensions are hereby requested. If there are any fees due beyond any fees paid by check with this response, authorization is given to deduct such fees from deposit account 50-0534.

Respectfully submitted,

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